

Agile, Lean Development & Government IT: How to Avoid Their Becoming Yet Another Oxymoron



© ITABHI Corporation 2012

PSM Users' Group Meeting 31 July 2012

**Robert N. Charette
President ITABHI Corp.**





Risk Ecology

Why are Lean & Agile Important?

Which Agency or Department:

- Is **NOT** being asked to do more, with less, and provide better outcomes than in the past?



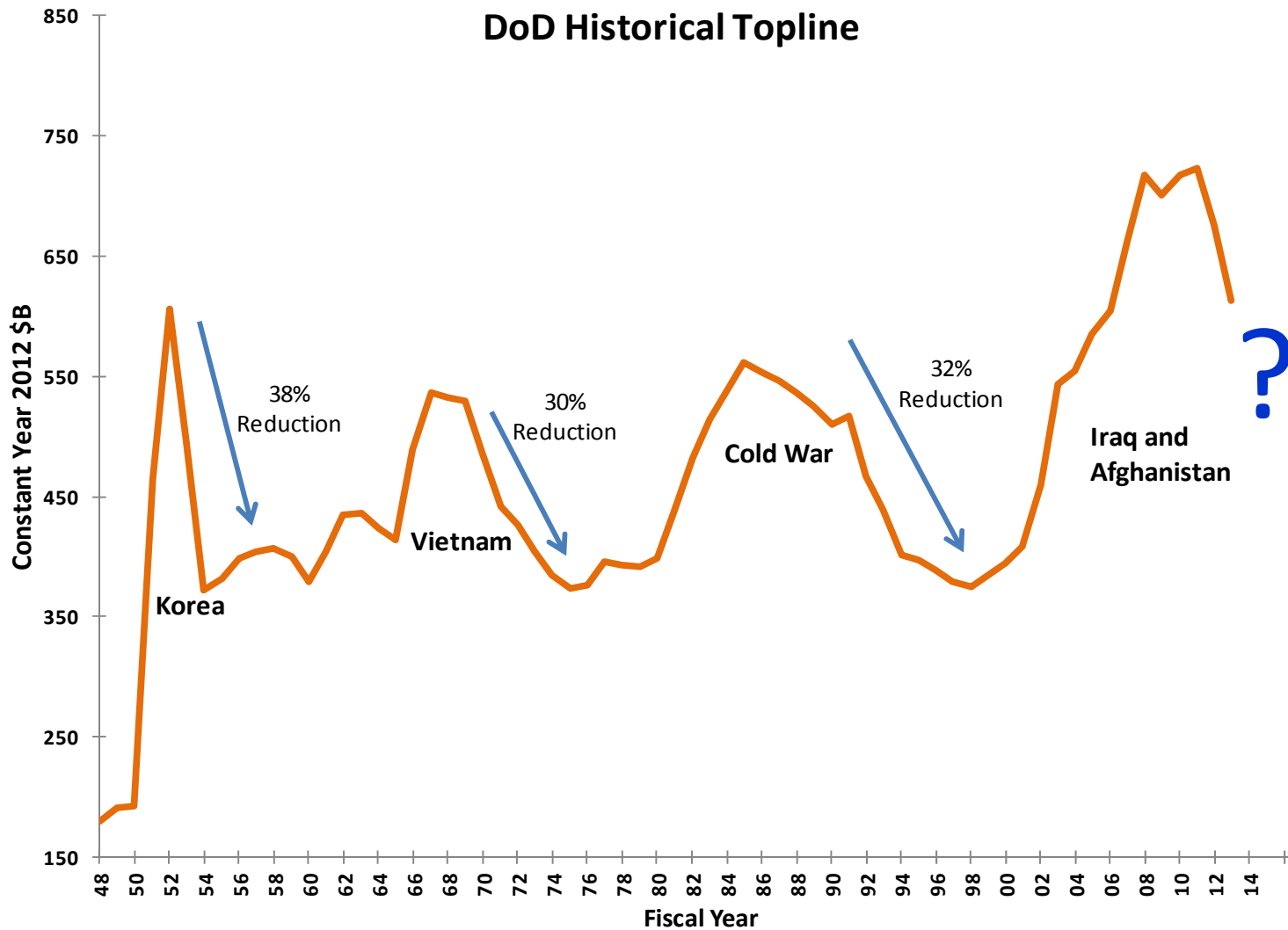
Why are Lean & Agile Important?

“Since 9/11, a near-doubling of the Pentagon’s modernization accounts...

... more than \$700 billion over 10 years in new spending on procurement, research and development – has resulted in relatively modest gains in actual military capability.”

**Robert M. Gates
24 May 2011**

Why are Lean & Agile Important?



Why are Lean & Agile Important?



“By 2020, the word ‘computer’ will have vanished from the English language.”

Michio Kaku

Beam Bluetooth Toothbrush

A Couple of Questions for You





SUCCESS

“Never confuse faith that you will prevail in the end—which you can never afford to lose—with the discipline to confront the most brutal facts of your current reality, whatever they might be.”

Adm. James Stockdale

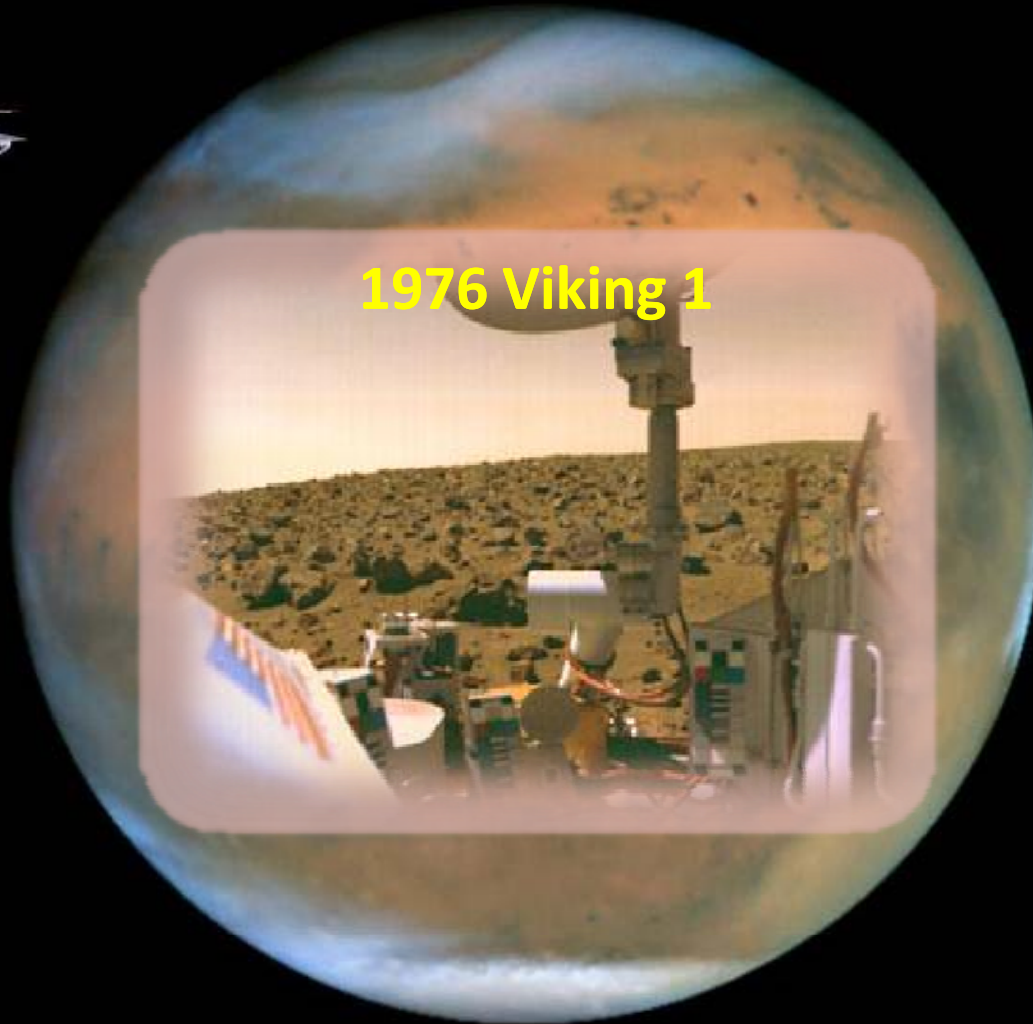


NASA: Faster, Better, Cheaper

Lessons for Agile and Lean Development in Government

It was a dark
and stormy night ...

Mars ... The Planet That Eats Spacecraft



Mars ... The Planet That Eats Spacecraft

Viking 1 and 2 - \$1.6 Billion in 1970 dollars





1993 Mars Observer



Original Cost (1985): \$212m

Final Cost: \$813-870m

NASA's Black Hole Budgets

Some Other Cost Overruns:

Landsat D (48%)

Infrared Astronomical Satellite (60%)

Earth Radiation Budget Experiment (61%)

Gamma Ray Observer (98%)

Space Telescope (98%)

Galileo (100%)

Tracking and Data Relay Satellite System (130%)

Pegasus (700%)

NASA Placed on GAO High Risk List in 1990

Mars Pathfinder Team Orders:

Put a lander and rover on the surface of Mars for 1/14th the equivalent cost of the Viking program, and do it in half the time.

Mars Pathfinder

Cost: \$265 million (\$175 m Dev)

Schedule: ~1000 days (not counting 570 in pre-dev)



Cheaper, Faster... then Splat



- ✓ **Pathfinder:** \$265m (\$175m Dev)
- ✓ **Global Surveyor:** \$273m (\$131m Dev)
- ✗ **Climate Orbiter:** ~\$125m (\$83m Dev)
- ✗ **Polar Lander:** ~\$165m (\$110m Dev)

4 FBC Project Failures in 1999



What NASA Found

- ❖ **Violation of the Bearden rule**
 - Complexity increases cost and development time; linear for schedule and exponential for cost

- ❖ **FBC processes needed to fully manage risk/create success not followed or fully put into place**
 - Organizational
 - Economic
 - Social
 - Technical
 - Political

Howard McCurdy. *Faster, Cheaper Better*, John Hopkins, 2001

What Was Recommended

Faster, Better, Cheaper, Risk

“We recommended that NASA define FBC and develop policies and guidance to describe its implementation. ... We also recommended that NASA fully incorporate FBC into the strategic management process. ... In addition, we recommended that NASA align its staffing with strategic goals.”*

**** FASTER, BETTER, CHEAPER:
POLICY, STRATEGIC PLANNING, AND
HUMAN RESOURCE ALIGNMENT
NASA OIG
March 13, 2001***



What Happened Next

- ✓ **Odyssey (2001): \$300 million**
- ✓ **Exploration Rovers (2003): \$820 mil**
- ✓ **Recon Orbiter (2005): \$720 million**
- ✓ **Phoenix (2008): ~\$480 million**



Meanwhile: Faster, Better, Cheaper... Gone



“FBC should be thrown in the waste basket.”

Sen. Kay Bailey Hutchinson (R-TX)

“... Echo[ing] what [Sen. Hutchinson] said yesterday: Let's throw out faster better cheaper in the garbage can.”

Rep. Nick Lampson (D-TX)



NASA Risk/Reward Tradeoffs

“The 14 of the 15 NASA projects currently in implementation, excluding James Webb Space Telescope , had an average development cost growth of \$79 million—or 14.6 percent—and schedule growth of 8 months from their baselines. With JWST, these numbers increase dramatically to almost 47 percent and 11 months, respectively.... Cost and schedule increases within NASA’s most technologically advanced and costly projects, such as JWST, can have cascading effects on the rest of NASA’s portfolio.”

**Assessments of Selected Large-Scale Projects
Government Accountability Office
March 2012**

But ...Back to the Future



**Project M: Develop robotic
lander to land on moon in
1000 days at a development
cost of \$115 million (\$1990)**

Why Didn't FBC Succeed at NASA?



Positives Galore:

- + Senior Level Advocacy
- + Widely Acknowledged Need
- + Early, High Profile Successes
- + Capable Personnel
- + Projects Technically Feasible
- + Given a 2nd Chance

Why Didn't FBC Succeed?

But... Plenty of Negatives:

- **Success/Failure Criteria Skewed**
 - *No level evaluation playing field*
 - *“Big Bets” where failure was not an option (even though it was said it was)*
- **End Became Means**
 - *FBC as mantra (slogan vs solution)*
 - *“Cheaper” was decision criteria (i.e., CFB)*
- **Halo Effect Trap**
 - *Success cause/effect misconstrued & lost*
- **Risk Environment Misunderstood**
 - *Untested assumptions*
 - *Stakeholders not all in*

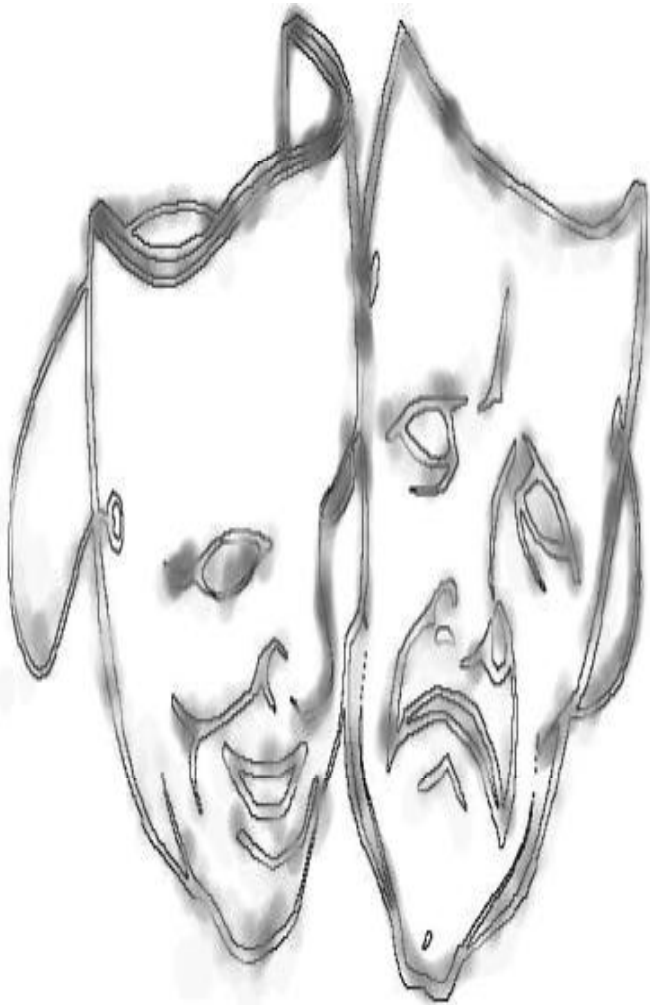


***“It isn't that they
can't see the solution.
It's that they can't
see the problem.”***

G. K. Chesterton



Agile, Lean Development & Defense IT



- **Similar Risk Issues to NASA & FBC**

- *No level playing field*
- *“Big Bets” with high profiles*
- *Cheaper is a (stated) priority*
- *Program failure rarely accepted :*
*“Federal agencies can’t afford to be wrong;
they’re not paid to take a second chance.”*

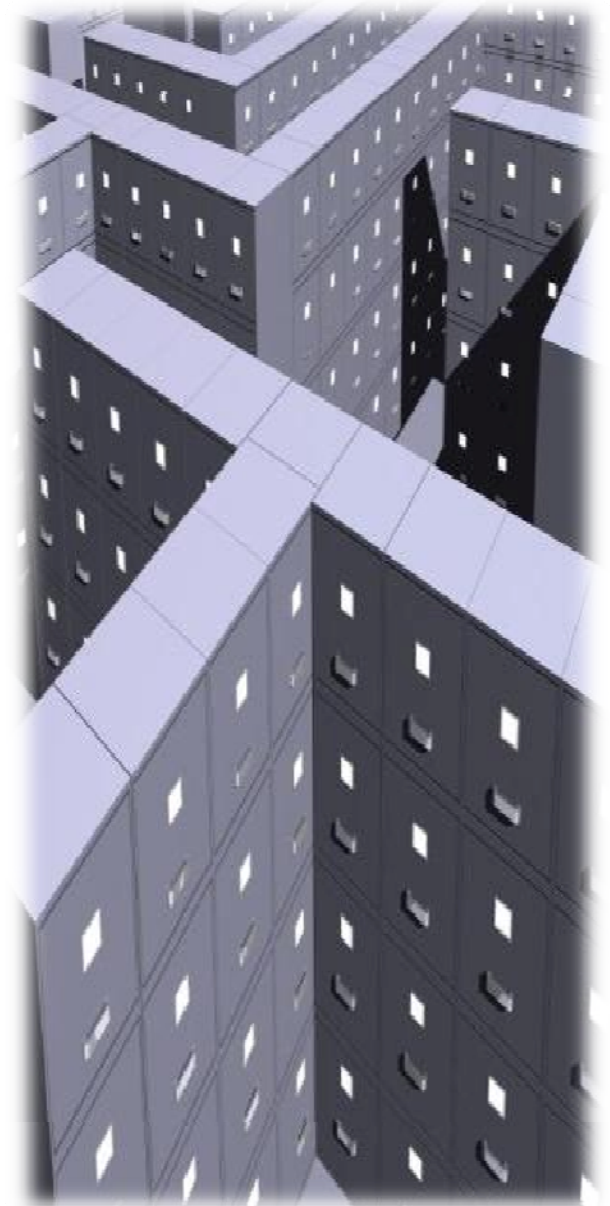
Frank Carr

- *But... If the System Works, Overruns
Are Forgotten*

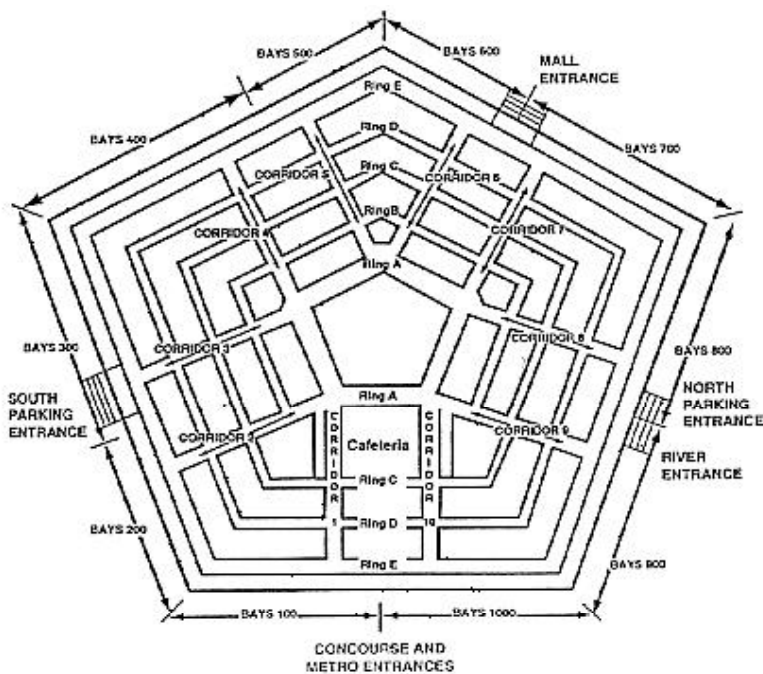
Some Distinct Differences Too

A Few DoD Facts of Life

- **Mission Requirements Different**
- **Acquisition & Contracts Kingmakers**
- **Efficiency Isn't Rewarded**
- **Programs Often Too Big To Fail**
- **High-level Senior Executive Turnover**
- **A Million Ways to Say *“NO!”***



Mars II ... The Planet That Eats Software Initiatives



“Software plays a major role in today's weapon systems. The ‘smarts’ of smart weapons are provided by software. Software is crucial to intelligence, communications, command and control. Software enables computerized systems for logistics, personnel, and finance. The chief ‘military software problem’ is that we cannot get enough of it, soon enough, reliable enough, and cheap enough to meet the demands of weapon systems designers and users. Software provides a major component of U.S. war-fighting capability.”

Report of the Defense Science Board
Task Force on Military Software
September 1987

The Taylor Conundrum



“The most significant reason software fails is that we don’t learn from our mistakes.”

Les Hatton

Photo © 1968 20th Century Fox

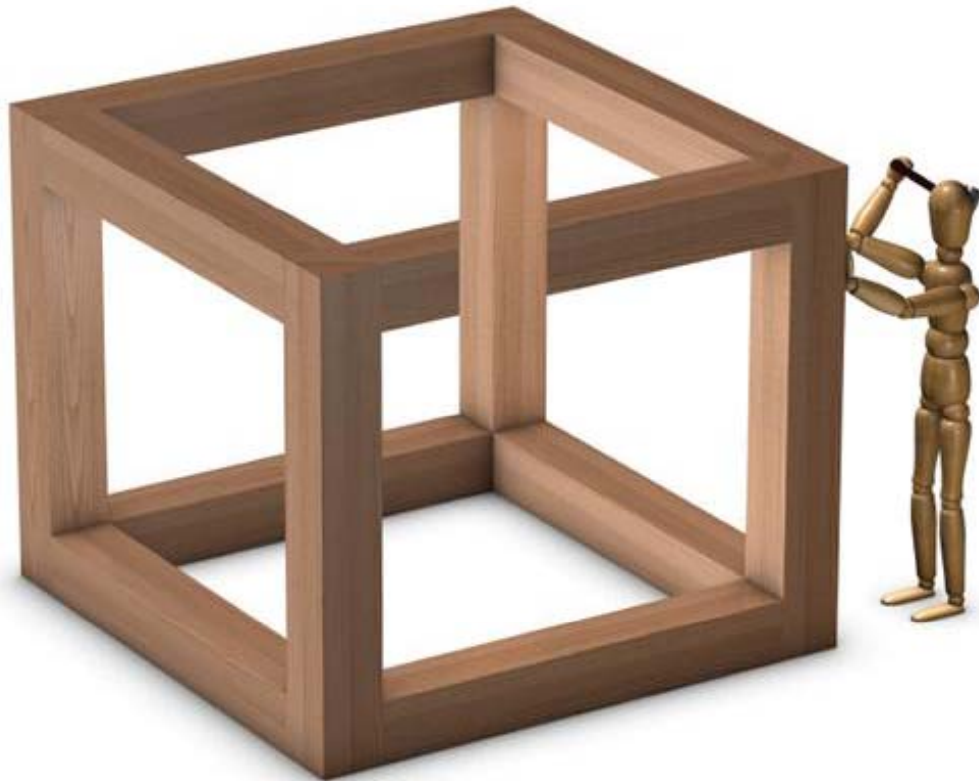
Agile, Lean & Success in DoD Enterprise IT

Some Personal Recommendations

- **New Mindset - Accept Stockdale Paradox**
- **Fully Understand the Risk Ecology**
 - *Define the operating context*
 - *What is meant by success/failure (at all levels)?*
 - *Understand incentives/behaviors*
 - *Listen to skeptics*
 - *Don't violate equivalent "Bearden Rule"*
 - *Find appropriate acquisition model (e.g., FIST)*
- **Seek Out Acquisition/Contracts Help**
- **Seek Out "Helpful Oversight" Folks' Help**
- **Seek Out PMs Help - It's Their Rear on the Line**
- **Tailor Acq. Model Given Helpful Advice**
- **Communicate Expectations Early and Often**



When Bringing Agile & LD Into the Enterprise, Remember



***“For a successful
technology,
reality must take
precedence over
public relations,
for nature cannot
be fooled.”***

Richard Feynman

A Few Final Thoughts

- Learn FBC (& Others') Lessons
- Know Your Risk Ecology
- Find Acquisition Vehicle
- Get Help From PMs/Acq. Community
- Don't Push Beyond Limits Without Knowing the Risk

NOW

LATER



*Master the details,
Master the risks.*

***Why are Lean & Agile
Important?***

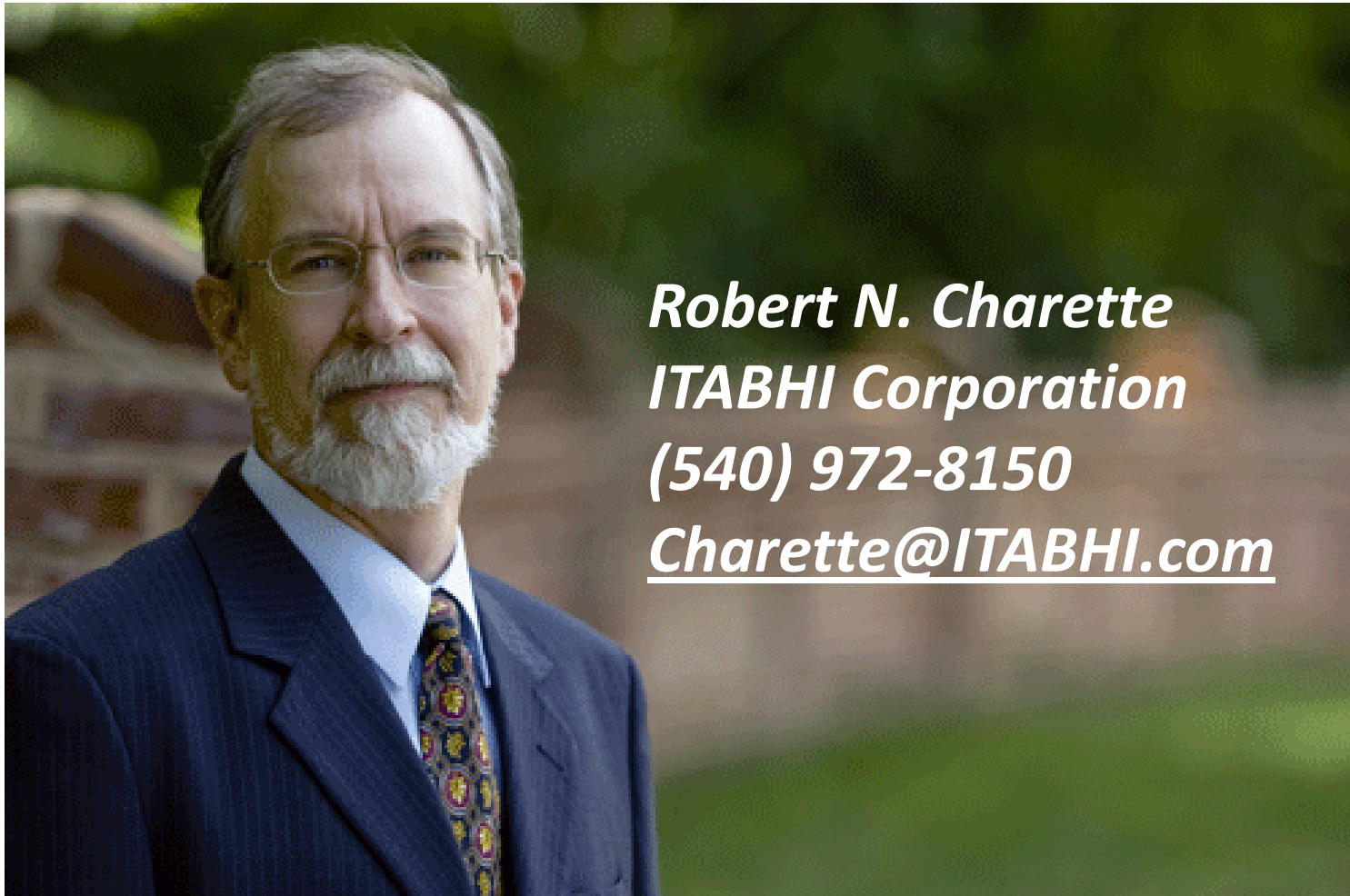
Future State of the US Armed Forces?





Profiting From Risk

Contact Information



Robert N. Charette
ITABHI Corporation
(540) 972-8150
Charette@ITABHI.com